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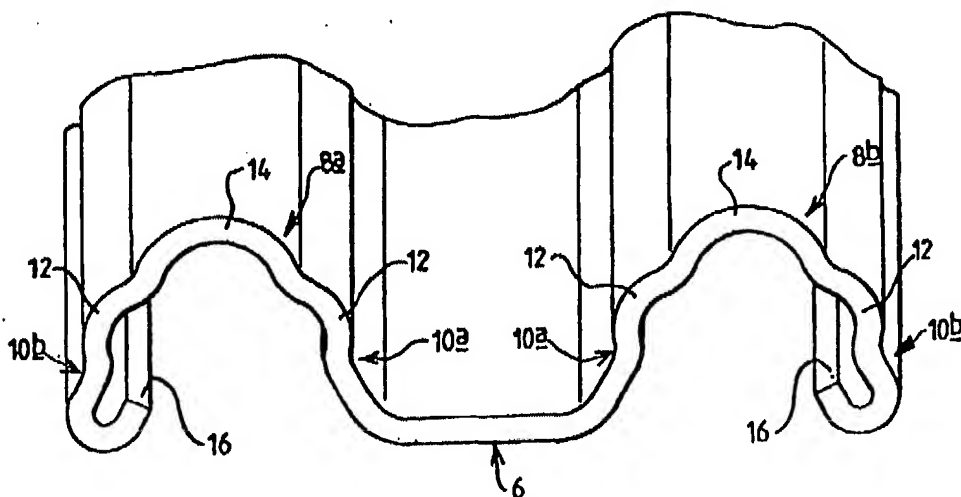
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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6: E04H 17/14	A1	(11) International Publication Number: WO 95/33113 (43) International Publication Date: 7 December 1995 (07.12.95)
(21) International Application Number: PCT/GB95/01138 (22) International Filing Date: 19 May 1995 (19.05.95) (30) Priority Data: 9410571.5 26 May 1994 (26.05.94) GB (71) Applicant (for all designated States except US): HADLEY INDUSTRIES PLC [GB/GB]; Downing Street, Smethwick, Warley, West Midlands B66 2PA (GB). (72) Inventor; and (75) Inventor/Applicant (for US only): DEELEY, Geoffrey, Thomas [GB/GB]; 1 Squirrels Hollow, Birch Road, Oldbury, Warley, West Midlands B68 0EY (GB). (74) Agent: FORRESTER KETLEY & CO.; Chamberlain House, Paradise Place, Birmingham B3 3HP (GB).		(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ, UG). Published <i>With international search report.</i>

(54) Title: **FENCE PALES**



(57) Abstract

A fence pale (5) comprises a rear wall (6), which in use is secured at spaced intervals to a support (4), two front walls (8a, 8b) spaced laterally one either side of the rear wall, and side walls (10) extending rearwardly from the front walls, including two inner side walls (10a) extending from the front walls to the rear wall, and two outer side walls (10b) extending generally rearwardly from the front walls to opposite sides of the rear wall (6). Each of the side wall (10a and 10b) is provided with a longitudinal rib (12), and each front wall (8) is provided with a longitudinal rib (14). Each of the ribs (12 and 14) is curved in shape, being convex from the front, and are of a size such as to provide most if not all of the walls (8 and 10). In this manner a greater width of metal may be utilised in a strength-providing manner permitting a fence pale to be manufactured of equal strength to the conventional fence pale, but of metal of a thinner cross section.

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FIG 1

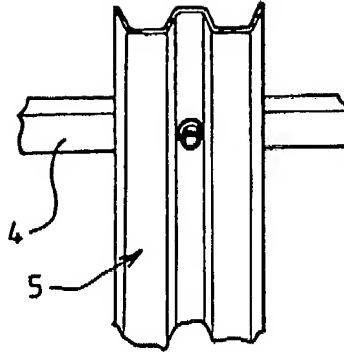


FIG 2

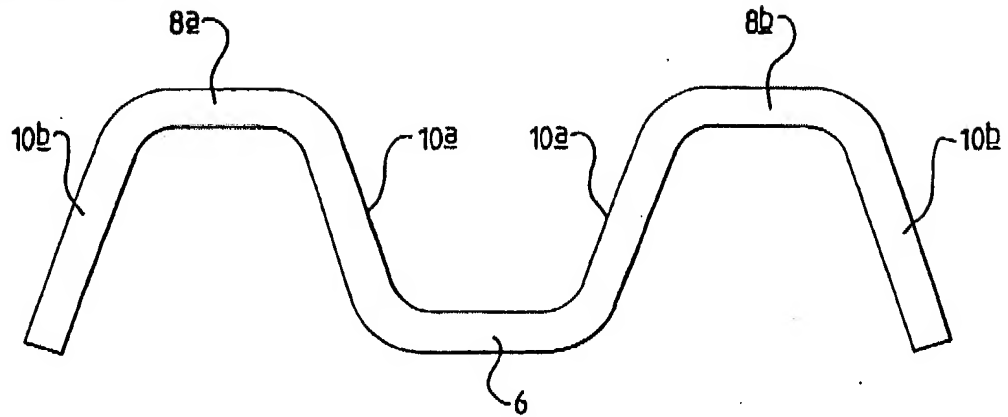
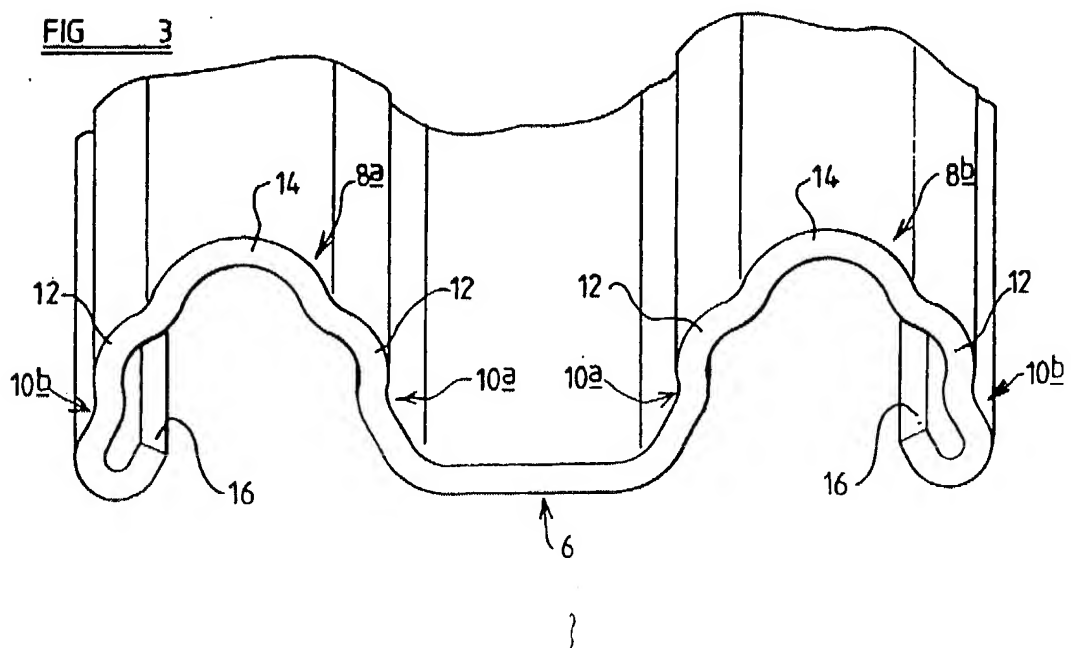


FIG 3



Title: Fence Pales**Description of Invention**

This invention is concerned with improvements relating to fence pales, particularly as are afforded by elongate members which in use are bolted or otherwise secured to a supporting structure in spaced, generally parallel relationship.

A fence pale which is in common use, known as the W-pale, comprises an elongate rear wall, two elongate front walls spaced laterally, one either side of the rear wall, and elongate side walls extending rearwardly from the front walls, including two inner side walls extending to the rear wall. Such a pale is hereinafter referred to as being of the kind specified.

Conventionally such a pale is produced by rolling strip metal stock, such as steel, which may be carried out by a hot rolling operation or a cold rolling operation.

In the conventional W-pale, the front and rear walls, and the side walls, are generally flat, with a small radius of curvature between each side wall and an adjacent front or rear wall.

It is in general desirable to provide a pale with as high a strength as possible, whilst minimising the quantity of metal used, in particular the thickness, and providing maximum coverage (width). More specifically there is a requirement, specified in British Standard BS1722 Part 12: 1990, that a pale be of specific width, and be of a minimum stiffness under load. To meet this requirement it has heretofore been necessary to provide a pale of the kind specific from a commercially available grade of sheet steel of specific thickness, and it is one of the various objects of this invention to provide a pale which meets with the requirement of said British Standard, but which may be manufactured of metal of lower thickness, without increasing the grade of the steel.

According to this invention there is provided a fence pale comprising an elongate rear wall to be secured to a support, two elongate front walls spaced laterally, one on either side of the rear wall, and elongate side walls extending

rearwardly from the front wall, which include two inner side walls extending to the rear wall, wherein two at least of the walls comprise ribs extending the length thereof.

Preferably the pale is produced by deforming sheet metal strip, the ribs being afforded by deformation of the side walls, but may be produced by other methods, such as by the extrusion of plastics material.

Preferably said two side walls are the inner side walls. Alternatively or in addition such ribs are provided in other side walls.

Alternatively or in addition such ribs are provided in the two front walls.

Preferably some at least of the ribs are of curved cross section, advantageously being convex when viewed from the front of the pale.

In this manner a greater width of metal may be incorporated into the relevant walls whilst permitting the plate to be maintained within the British Standard size requirements.

Such use of additional metal is more effective in providing strength to the pale, compared with simply increasing the gauge (thickness) of the wall, and by the use of the invention it has been found that the strength of the pale may be maintained within the parameters laid down by said British Standard whilst reducing the thickness of the metal.

If desired the walls of the pale may be generally flat, said ribs being provided over only a small width of the wall. Preferably however each rib is provided at such a size as to extend primarily over the whole of the width of the wall, such that the majority at least of the wall is afforded by the rib.

The invention is specifically advantageous in the application to a pale of the kind specified, in particular a W-pale, wherein the angle between each side wall and a front or rear wall from which it extends is greater than 90°. Preferably the side edges of the outer walls are rolled inwardly, providing advantages of safety.

According to this invention there is provided a pale of the kind specified wherein at least the side walls of the rib, and preferably also the front wall of the pale, comprises a rib extending substantially the whole of the length thereof, said ribs preferably being convex in shape when viewed from the front.

There will now be given a detailed description, to be read with reference to the accompanying drawings, of a pale which is a preferred embodiment of this invention, having been selected for the purposes of illustrating the invention by way of example.

In the accompanying drawings:

Figure 1 is a front elevation showing a conventional pale screwed to a support;

Figure 2 is a sectional view of the conventional pale; and

Figure 3 is a cross-sectional view of the pale which is the preferred embodiment of this invention, shown to a different scale.

The pale 5 illustrated in Figures 1 and 2 is manufactured to meet with the requirements of BS1722: Part 12: 1990, having an overall width of 70mm, and being manufactured of sheet steel by a cold rolling operation on a strip having a thickness either of 2.5mm or 3.0mm, meeting the standard for "general purpose use". The pale comprises a rear wall 6, which in use is secured at spaced intervals to a support 4, two front walls 8a, 8b spaced laterally, one either side of the rear wall, and side walls 10 extending rearwardly from the front walls, including two inner side walls 10a extending from the front walls to the rear wall, and two outer side walls 10b extending generally rearwardly from the front walls, the angle between each side wall 10 and the front wall 8 from which it extends being obtuse, typically between 110° and 145°, and the angle between each side wall 10a and the rear wall 6 being obtuse, such that when observed from the front, on either side of the rear wall 6 there is provided two generally convex pillars each provided by two side walls and a front wall.

In the pale which is the preferred embodiment, illustrated in Figure 3, each of the side walls 10a and 10b is provided with a longitudinal rib 12, and

each front wall 8 is provided with a longitudinal rib 14. Each of the ribs 12 and 14 is curved in shape, and is in particular convex when viewed from the front (that is, from above, in Figure 3).

In this manner it has been found that a pale may be manufactured which is equal in strength to a pale of the kind illustrated in Figure 2, in which the thickness of the sheet metal from which the pale is formed has been reduced from 2.5mm to 1.8mm. A pale may thus be manufactured in accordance with the performance requirements of said British Standard less expensively, without any impairment to the strength.

Whilst as illustrated in Figure 3 the ribs 12 and 14 are of a size such as to provide most if not all of the walls 10 and 8 themselves, the ribs may if desired be smaller, so that the planar nature of the basic walls 8, 10 within which the ribs 12, 14 are provided is retained evident.

If desired a similar rib may be provided in the wall 6, although since this wall is in use secured to a support, whilst in the performance of a strength measurement exercise some improvement in the strength will be obtained, in practice such increase in strength is not significant from a practical point of view.

Whilst the invention has been devised specifically for the manufacture of pales from steel strip by a cold rolling operation, it will of course be appreciated that the invention may be utilised with other metals, which may be formed by other processes, such as hot rolling.

In addition, the advantages of the invention in providing an increase in the strength of the pale whilst reducing the quantity of material present, means that similar advantages may be obtained by the manufacture of the pale from non-metallic materials, such as by extrusion from plastics.

Conveniently the side edges 16 of the outer walls are rolled inwardly, so that when the pale is produced from pre-galvanised material the edges of the side walls are hidden from view and protected to some extent at least by a sacrificial electro-chemical reaction with the adjacent surfaces of the outer side walls.

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The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

CLAIMS

1. A fence pale comprising an elongate rear wall (6) to be secured to a support, two elongate front walls (8a, 8b) spaced laterally, one on either side of the rear wall, and elongate side walls (10) extending rearwardly from the front wall, which include two inner side walls (10a) extending to the rear wall (6), wherein two at least of the walls (6, 8, 10) comprise ribs (12, 14) extending the length thereof.
2. A fence pale according to Claim 1, produced by deforming sheet metal strip, the ribs being afforded by deformation of the walls.
3. A fence pale according to one of Claims 1 and 2 wherein said ribs are provided on the inner side walls (10a, 10a).
4. A fence pale according to any one of the preceding claims wherein said ribs are provided on outer side walls (10b, 10b).
5. A fence pale according to any one of the preceding claims wherein such ribs are provided in the two front walls (8a, 8b).
6. A fence pale according to any one of the preceding claims wherein some at least of the ribs (12, 14) are of curved cross section.
7. A fence pale according to Claim 6 wherein the ribs are convex when viewed from the front of the pale.
8. A fence pale according to any one of the preceding claims wherein the walls (6, 8, 10) of the pale are generally flat, said ribs (12, 14) being provided over only a small width of the wall.

9. A fence pale according to any one of Claims 1 to 7 wherein each rib (12, 14) is provided at such a size as to extend primarily over the whole of the width of the wall, such that the majority at least of the wall is afforded by the rib.

10. A fence pale according to any one of the preceding claims wherein the side edges (16) of the outer walls are rolled inwardly.

11. A pale of the kind comprising an elongate rear wall (6), two elongate front walls (8a, 8b) spaced laterally, one either side of the rear wall (6), and elongate side walls (10) extending rearwardly from the front walls, including two inner side walls (10a, 10a) extending to the rear wall (6), and two outer side walls (10b, 10b) extending from the front walls to opposite sides of the rear wall (6), characterised in that two at least of the walls (8, 10) comprise ribs (12, 14) extending the length thereof.

12. A pale according to Claim 10 wherein the ribs (12, 14) are convex in shape, when viewed from the front.

INTERNATIONAL SEARCH REPORT

Inter. Application No
PCT/GB 95/01138

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 E04H17/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 E04H B21D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US,A,2 809 017 (LIP FOU WONG) 8 October 1957 see the whole document ---	1-6, 10, 11
Y	WO,A,93 18872 (KORSTRÄSK MEKANISKA) 30 September 1993 see page 2, line 30 - page 3, line 26; figure 4 ---	1-6, 10, 11
A	GB,A,311 111 (HANSEN) 9 May 1929 see the whole document ---	1
A	GB,A,2 249 327 (HADLEY INDUSTRIES PLC) 6 May 1992 -----	

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☒ Patent family members are listed in annex.

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28 August 1995

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05.09.95

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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-2809017	08-10-57	NONE	
WO-A-9318872	30-09-93	SE-B- 469968 AU-B- 3771293 EP-A- 0659109 SE-A- 9200854	18-10-93 21-10-93 28-06-95 20-09-93
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GB-A-2249327	06-05-92	NONE	